

**The University Of Jordan
Faculty Of Medicine**



REPRODUCTIVE SYSTEM

By

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My advice to you is to focus on the diagrams that I drew. These diagrams cover the doctor's ENTIRE EXPLANATION AND WHAT HE HAS MENTIONED

Edited by Dana Hamo

Quick Recall :

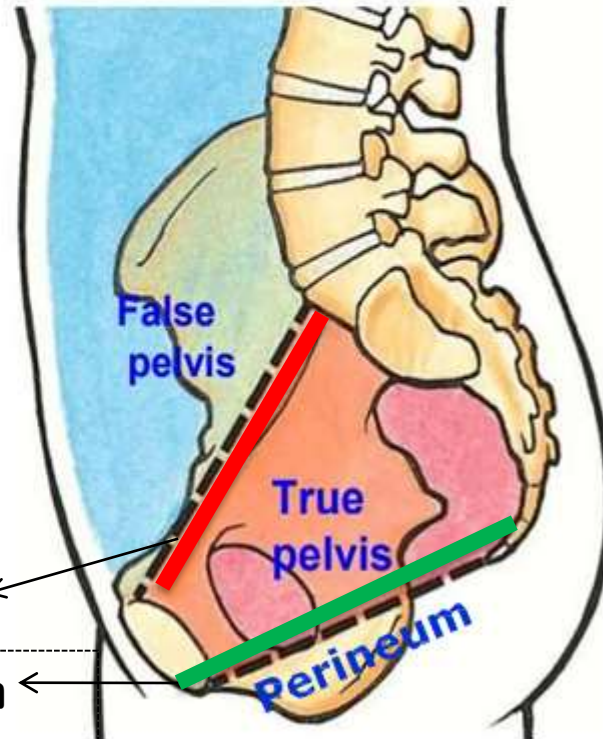
Pelvis

**Greater Pelvis
(False Pelvis)**

Anterosuperior to pelvic brim
It is a part of the abdomen

**Lesser Pelvis
True)
(pelvis**

Posteriorinferior to pelvic brim
The term pelvis means the lesser pelvis



Pelvic brim

Pelvic diaphragm that separates the true pelvis above and perineum **BELOW**

Pelvis **ABOVE** By pelvic diaphragm

Perineum **BELOW** By pelvic diaphragm

Perineum

It is the diamond-shaped lower end of the trunk

Glossary : peri : around, ineo - discharge, evacuate

Location : it lies below the pelvic diaphragm, between the upper parts of the thighs.

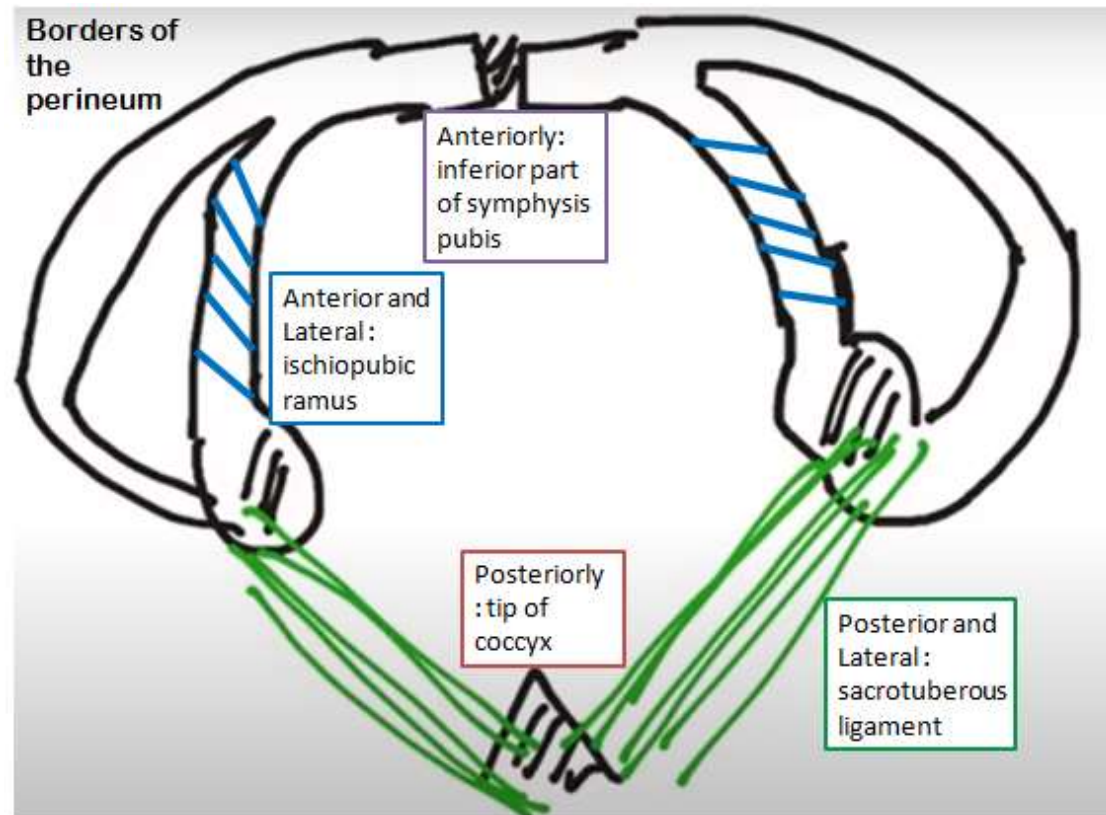
Boundaries :

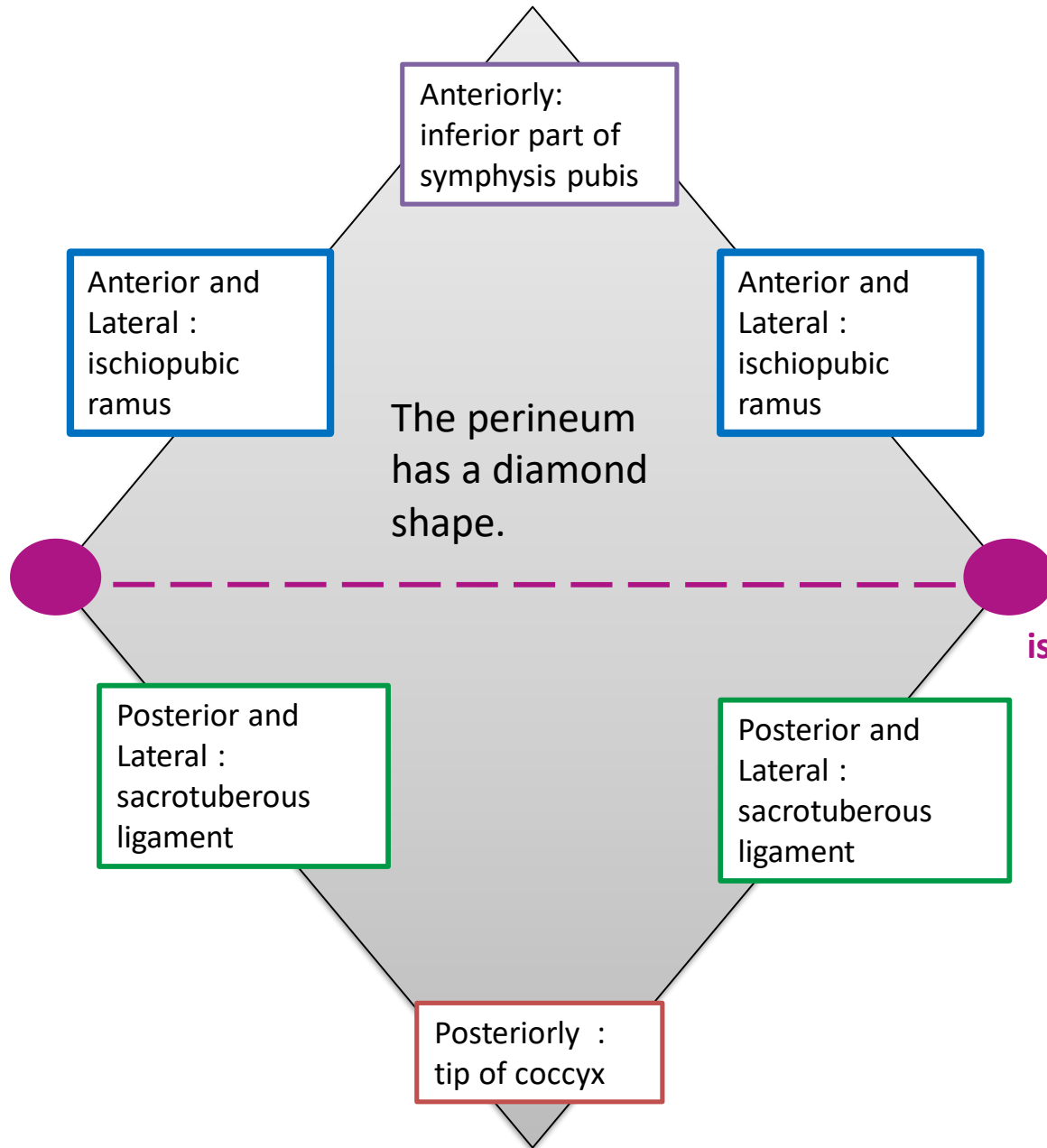
Anteriorly : Inferior margin of symphysis pubis.

Posteriorly : Tip of coccyx.

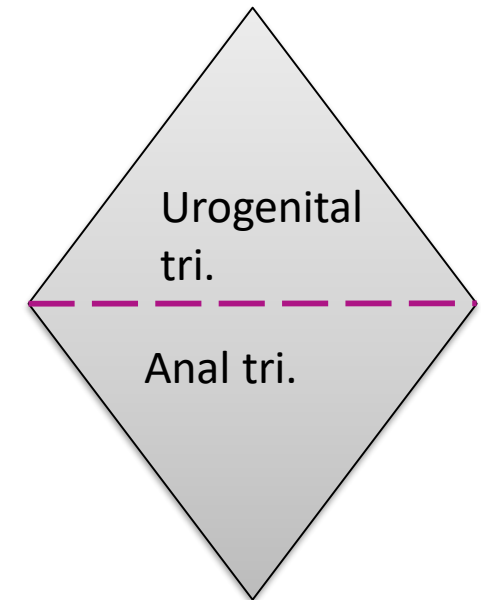
Anterolateral : Fused rami of pubis and ischium and ischial tuberosity.

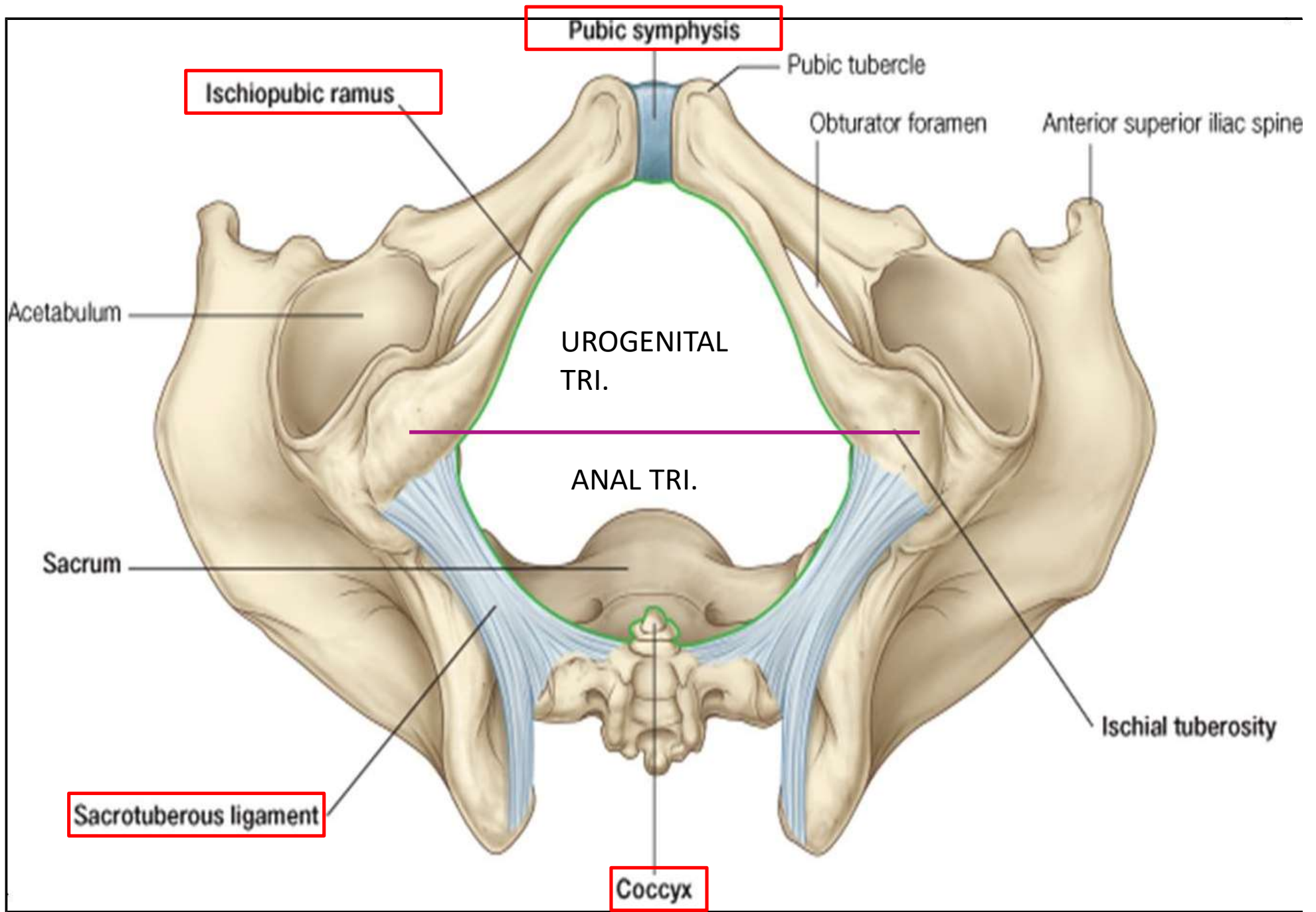
Posterolateral : Sacrotuberous ligaments.





- Same boundaries as the pelvic outlet.
- If we drew a line between the 2 ischial tuberosities, the diamond shape will be divided into 2 triangles.
- The ANTERIOR triangle is called urogenital triangle
- The POSTERIOR triangle is called anal triangle



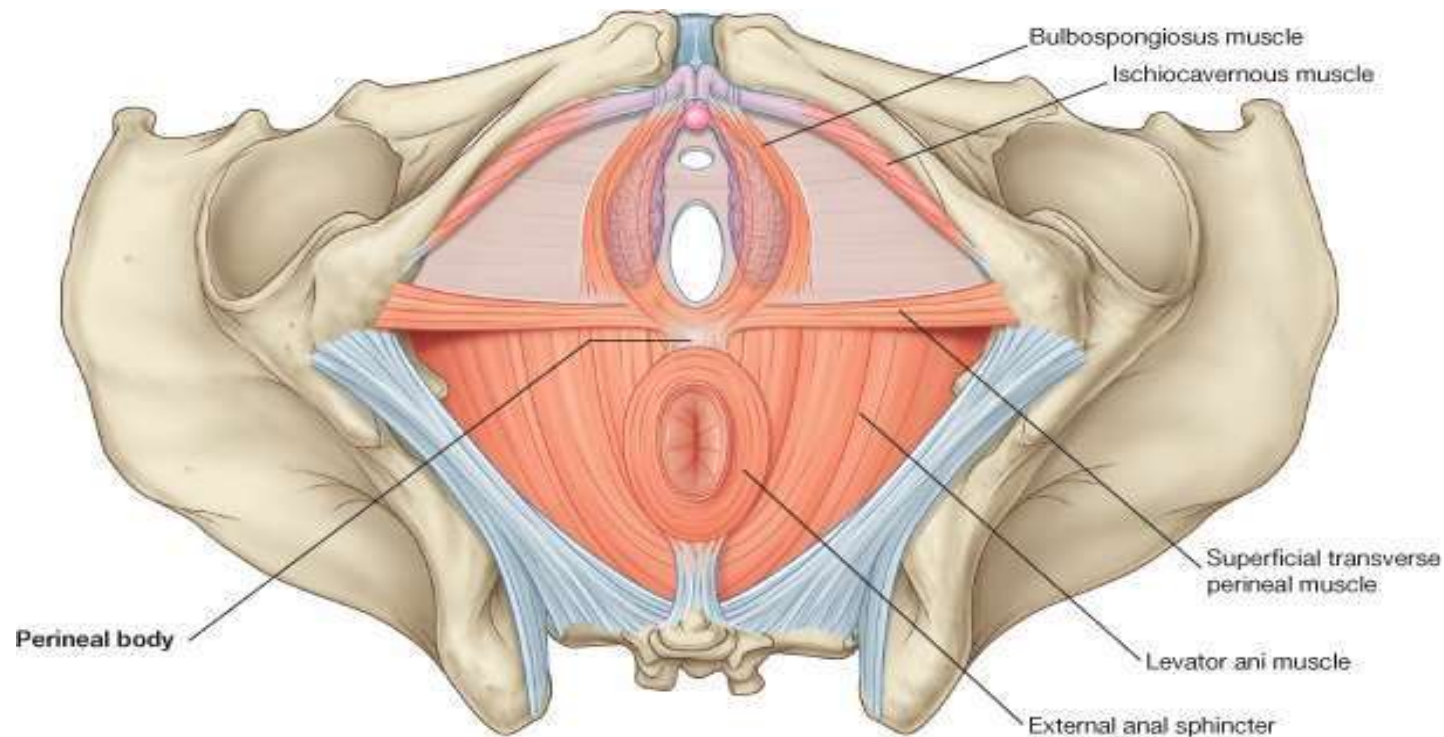


Divisions of the Perineum :

❖ By a line joining the anterior parts of the ischial tuberosities, the perineum is divided into two triangles :

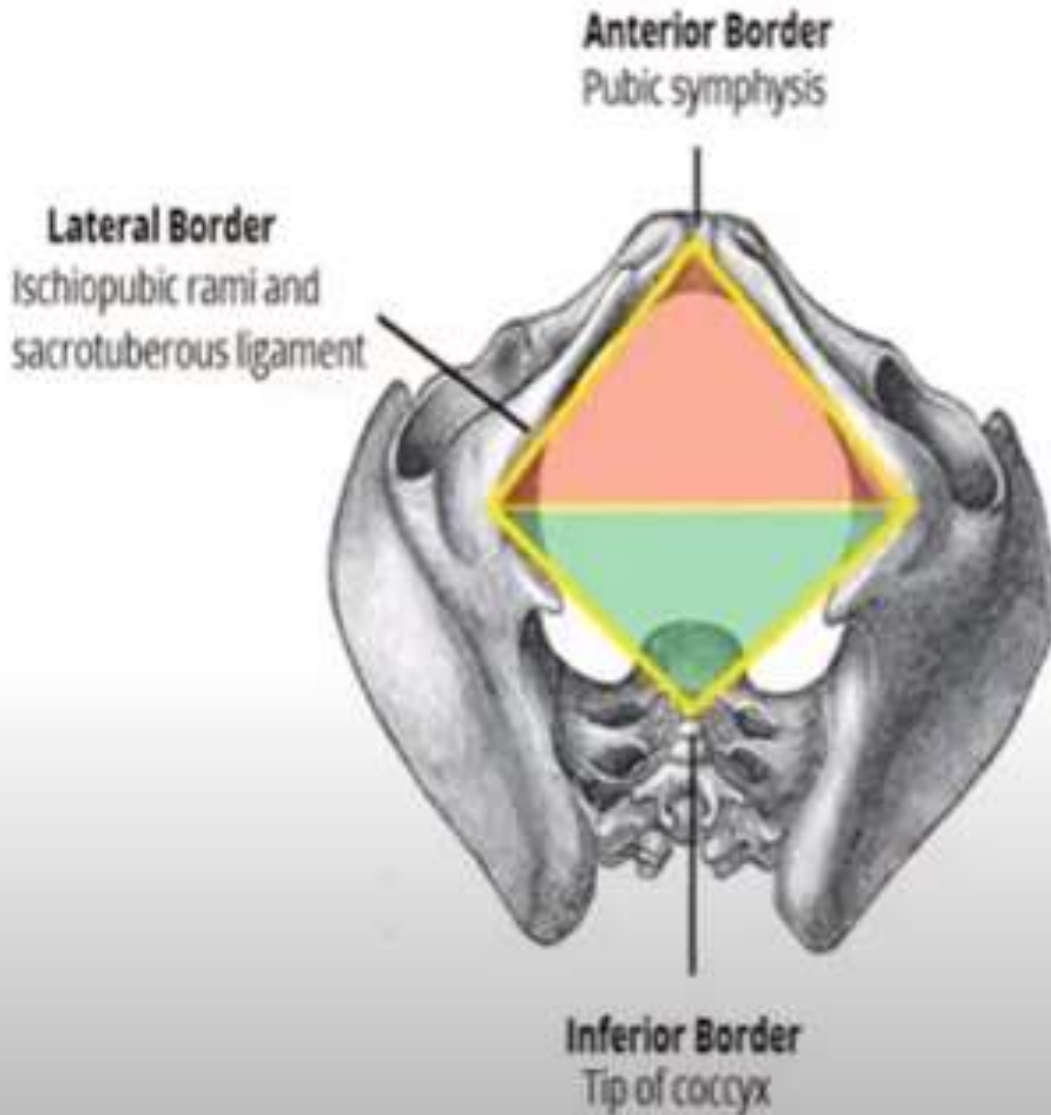
❖ **Anteriorly** : Urogenital triangle

❖ **Posteriorly** : Anal triangle

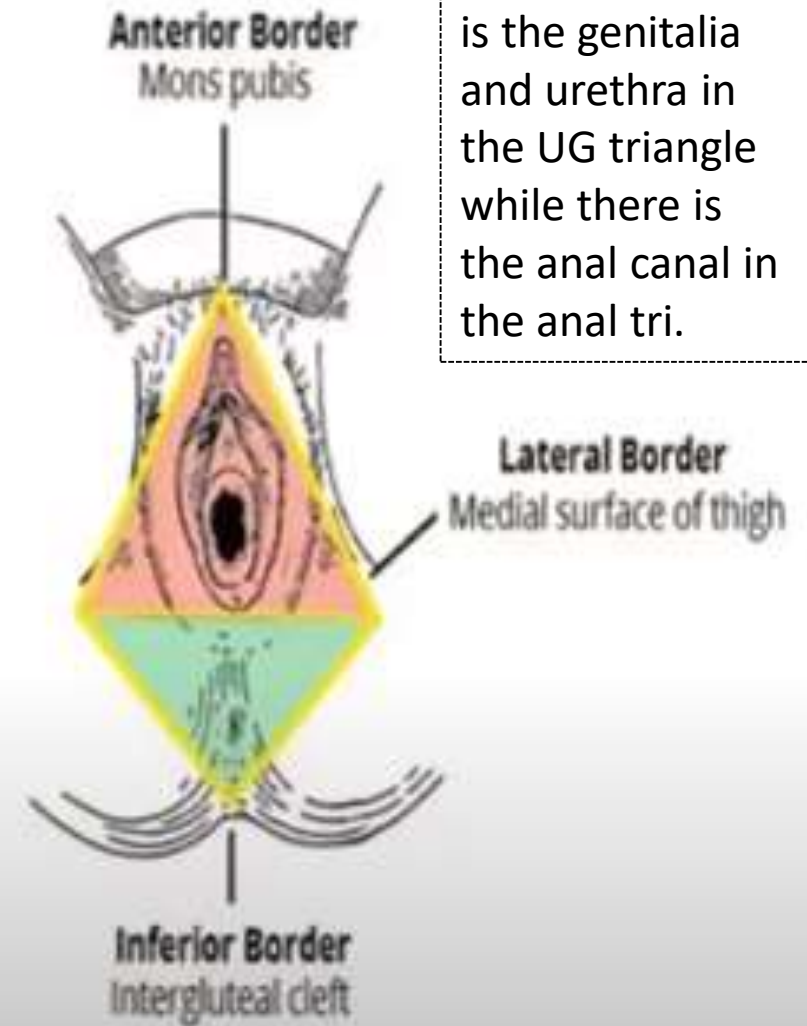


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Anatomical Borders:



Surface Borders:



In females, there is the genitalia and urethra in the UG triangle while there is the anal canal in the anal tri.

Perineum

Anterior

Posterior

Urogenital triangle

Contains

- 1-External genitalia in male or female (already discussed – slide 8)
- 2-Superficial perineal pouch
- 3-Deep perineal pouch

Anal triangle

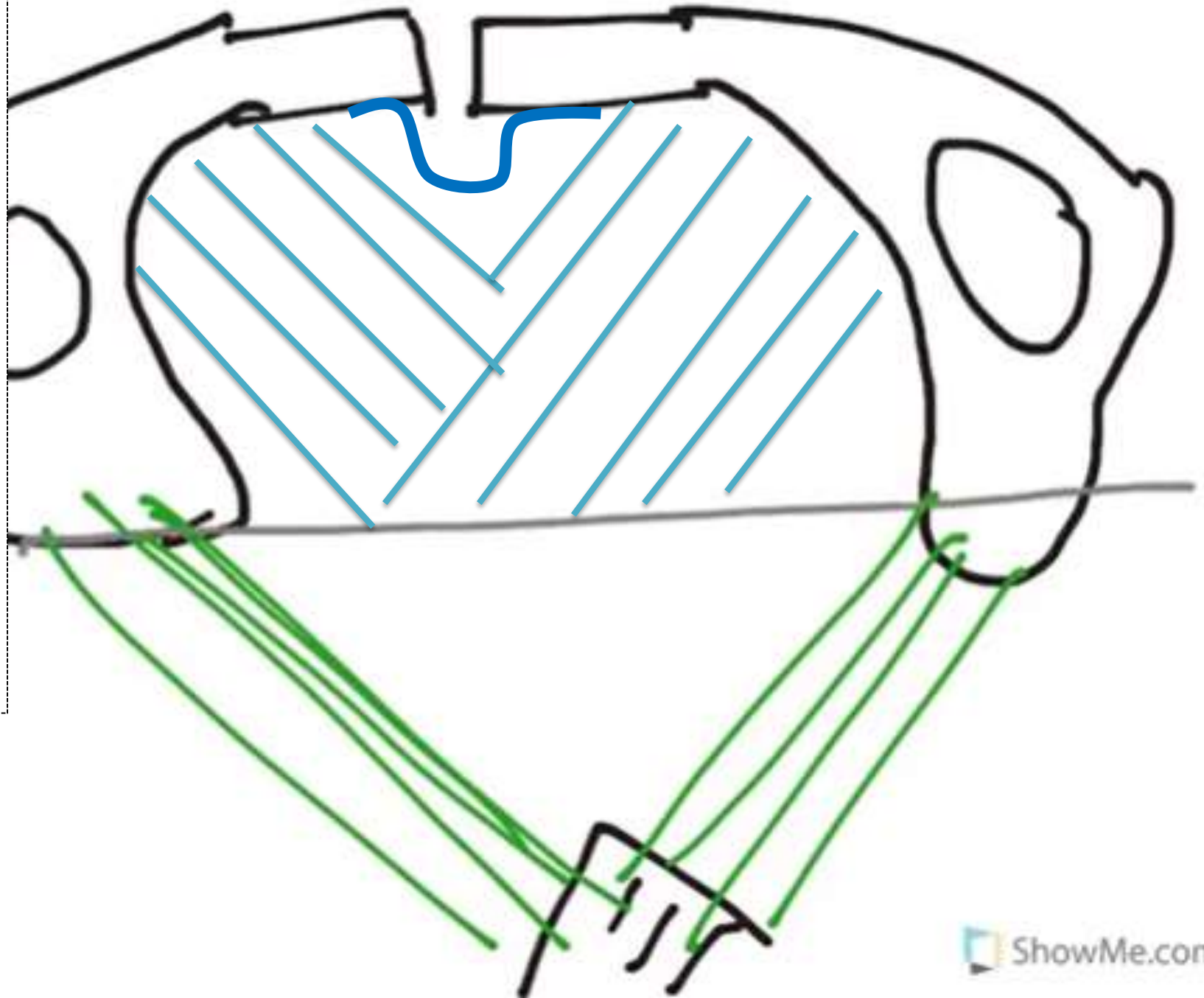
Contains

- 1-Anal Canal (already discussed – slide 8) in the median plane
- 2-Ischiorectal fossa on either side of anal canal - will be discussed in lecture 11
- 3-Pudendal canal in side wall of ischiorectal fossa - will be discussed in lecture 11

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Discussed in the next section

Urogenital tri. is covered by PERINEAL MEMBRANE. This membrane is **not found in the anal tri.** and it separates between **deep and superficial perineal pouch.** It also leaves a **gap** anteriorly between the membrane and symphysis pubis.



Urogenital triangle:

Contains these fascial layers

1-The membranous layer of the superficial fascia of the perineum (Colles fascia).

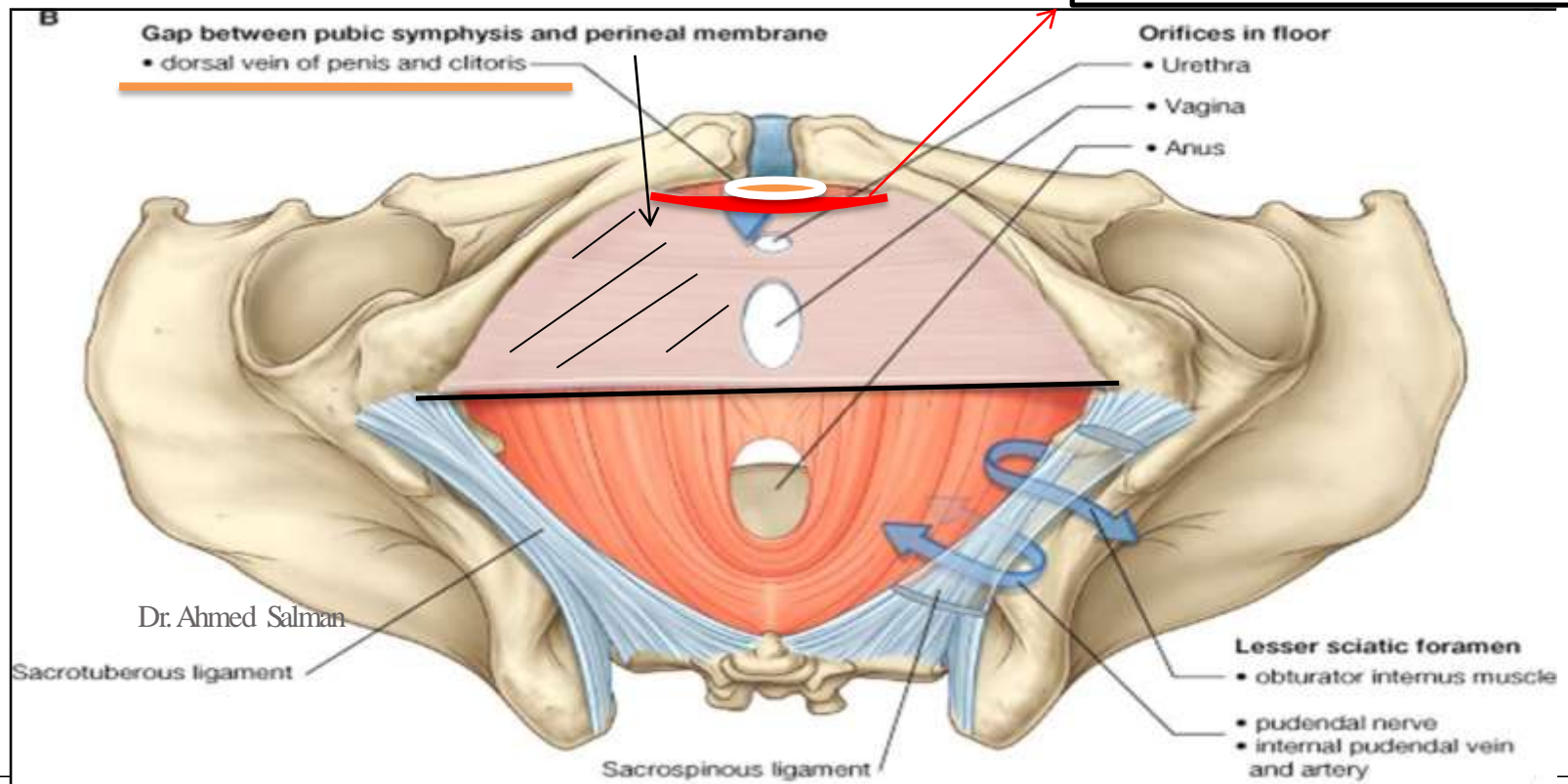
2-The perineal membrane

It is a triangular fibrous sheet which lies across the pubic arch.

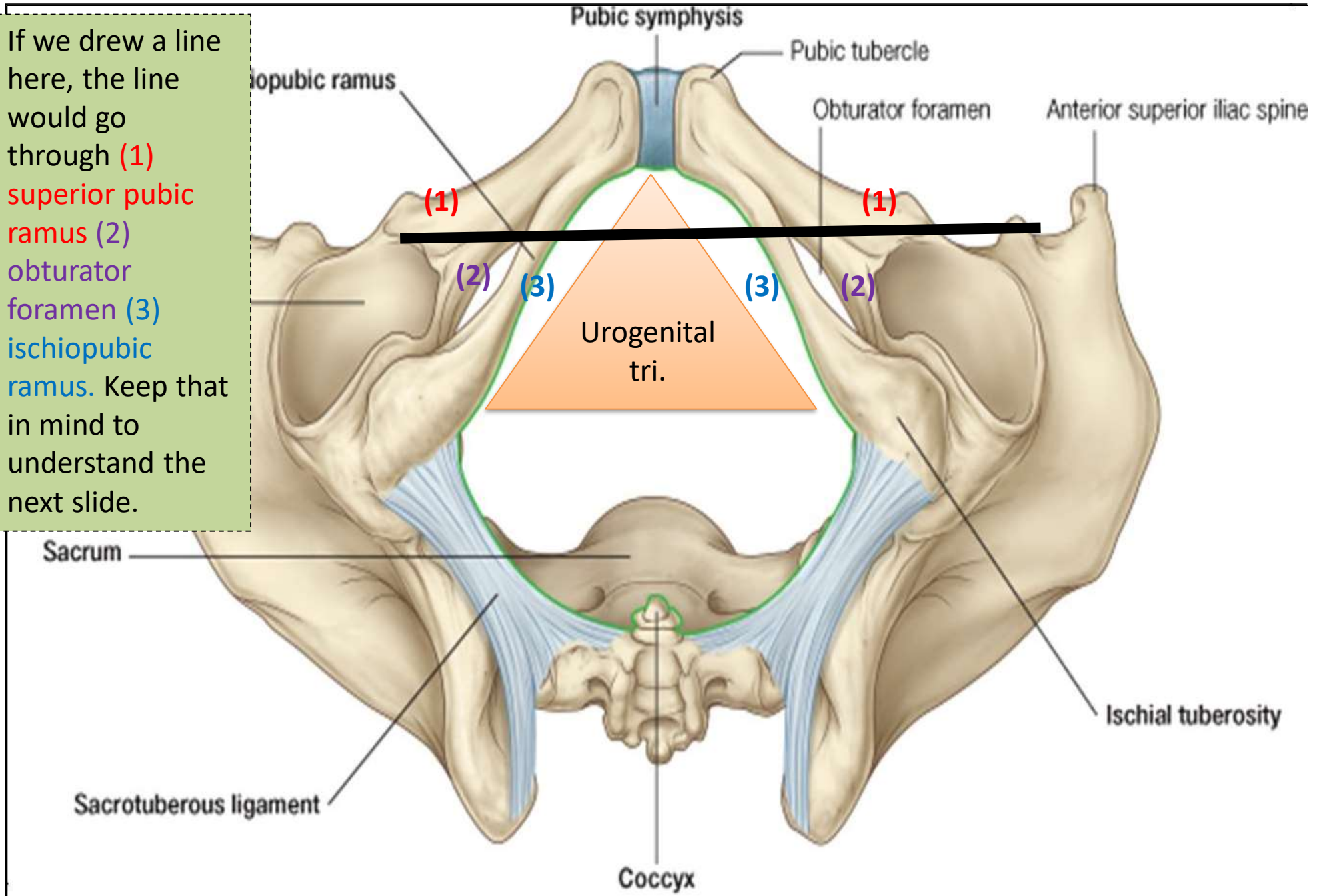
The perineal membrane :

- Forms the floor of the deep perineal pouch.
- Forms the roof of the superficial perineal pouch

Anteriorly, there is a **Transverse perineal ligament** with small window in front of it as a passage for the **dorsal vein of penis and clitoris**. In males, the vein goes to the prostatic venous plexus and in females, the vein drains in the vesical venous plexus



If we drew a line here, the line would go through (1) superior pubic ramus (2) obturator foramen (3) ischiopubic ramus. Keep that in mind to understand the next slide.



Borders of Deep perineal pouch :

pouch :

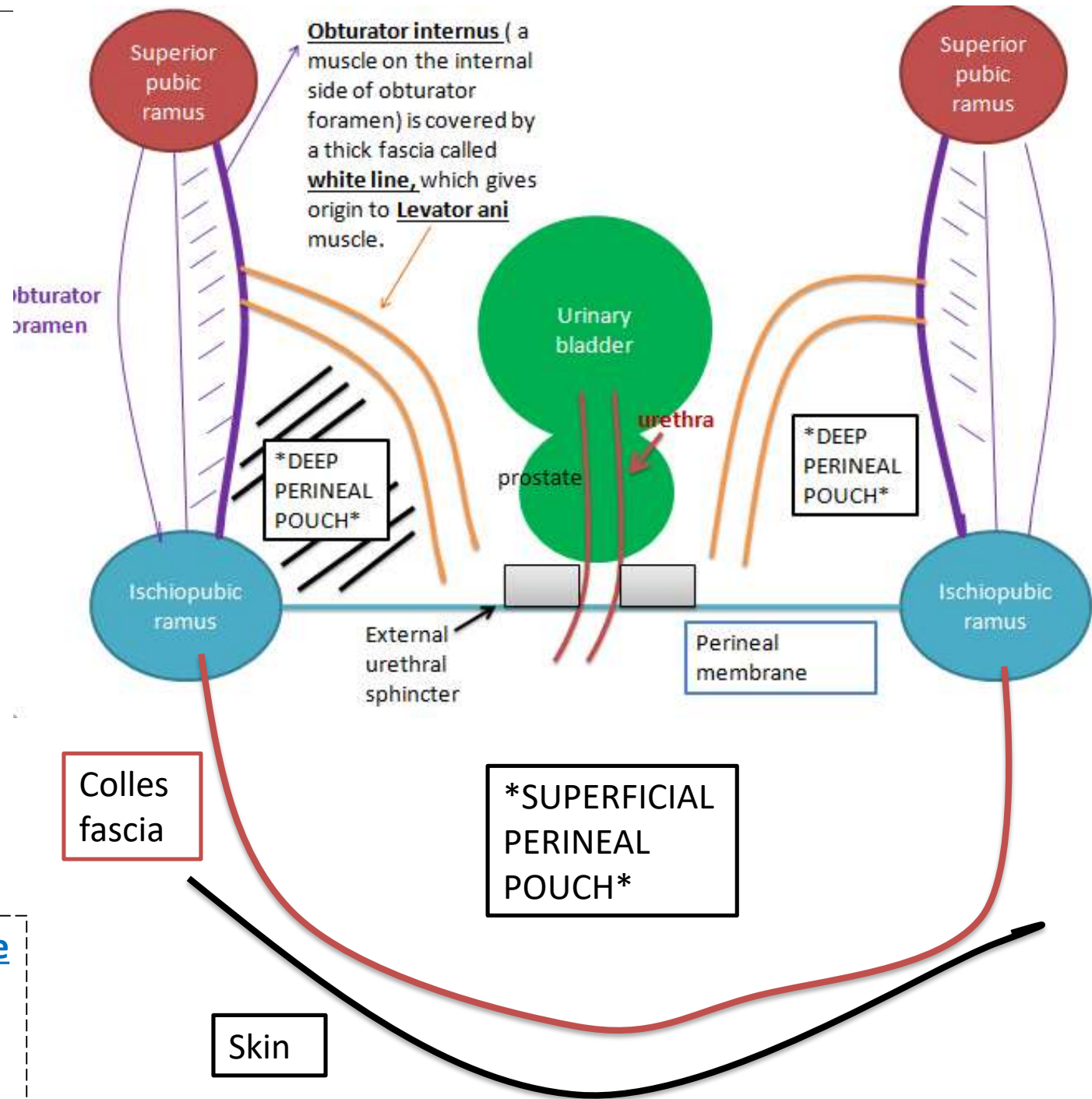
- Floor = perineal membrane
- Roof = levator ani muscle or “fascia covering inferior surface of the pelvic diaphragm”
- Lateral = obturator fascia
- Anterior and Posterior = CLOSED
- it is a CLOSED SPACE.

Borders of Superficial perineal pouch :

pouch :

- Floor = Colles fascia
- Roof = perineal membrane
- The floor and the roof are connected at the ischiopubic ramus
- Posteriorly = CLOSED
- Anteriorly = OPEN = tiny opening to the anterior abdominal wall

REMEMBER ! The perineal membrane is ONLY found in the urogenital tri. And it divides it into deep and superficial perineal pouch



Muscles of perineum

Nerve Supply : All muscles in superficial and deep perineal pouches are supplied by perineal branch of pudendal nerve

❑ Muscles of Superficial Perineal Pouch :

See slide 16 for
more clarification

1 Ischiocavernosus :

Site : Each covers the crus penis.

Action : it compresses crus penis to maintain erection of penis.

2 Bulbospongiosus :

Site : covers bulb of penis. In female, it is split into two parts to cover bulbs of vestibule.

Action : **In Male** ,Assist in erection of penis and eject last drops of urine during micturition.

In Female: act as sphincter vagina and help in erection of clitoris

3 Superficial transverse perineal:

Site : on posterior edge of perineal membrane in front of anus.

Action : fixation the perineal body.

Muscles of the Deep perineal Pouch : *These muscles form the urogenital diaphragm.*

1- Sphincter urethrae :

Site : it surrounds membranous urethra.

Attachments : it is formed of two parts :

- **Inferior (or superficial) part :**
- **Superior (or deep) part :**
- **Action :** It represents the voluntary control of urethra.

See slide 16 for
more clarification

-2 Deep transverse perineal

Site : on deep surface of posterior border of the perineal membrane.

Action : fixation of perineal body.

Muscles of perineum

Transversus perineal muscle (superficial and deep). Function = fixation of the perineal body

Ischiocavernosus muscle (compress the crus of penis to maintain penile erection)

Bulb of the penis surrounds the urethra

External urethral sphincter (voluntary muscle)

Crus of penis (corpus cavernosum)

Bulbospongiosus muscle surrounds the bulb (The bulbospongiosus muscle acts to expel remaining urine from the urethra after the bladder has completed its emptying. In males it also aids in the final stages of erection)

Obturator foramen

Urinary bladder

urethra

prostate

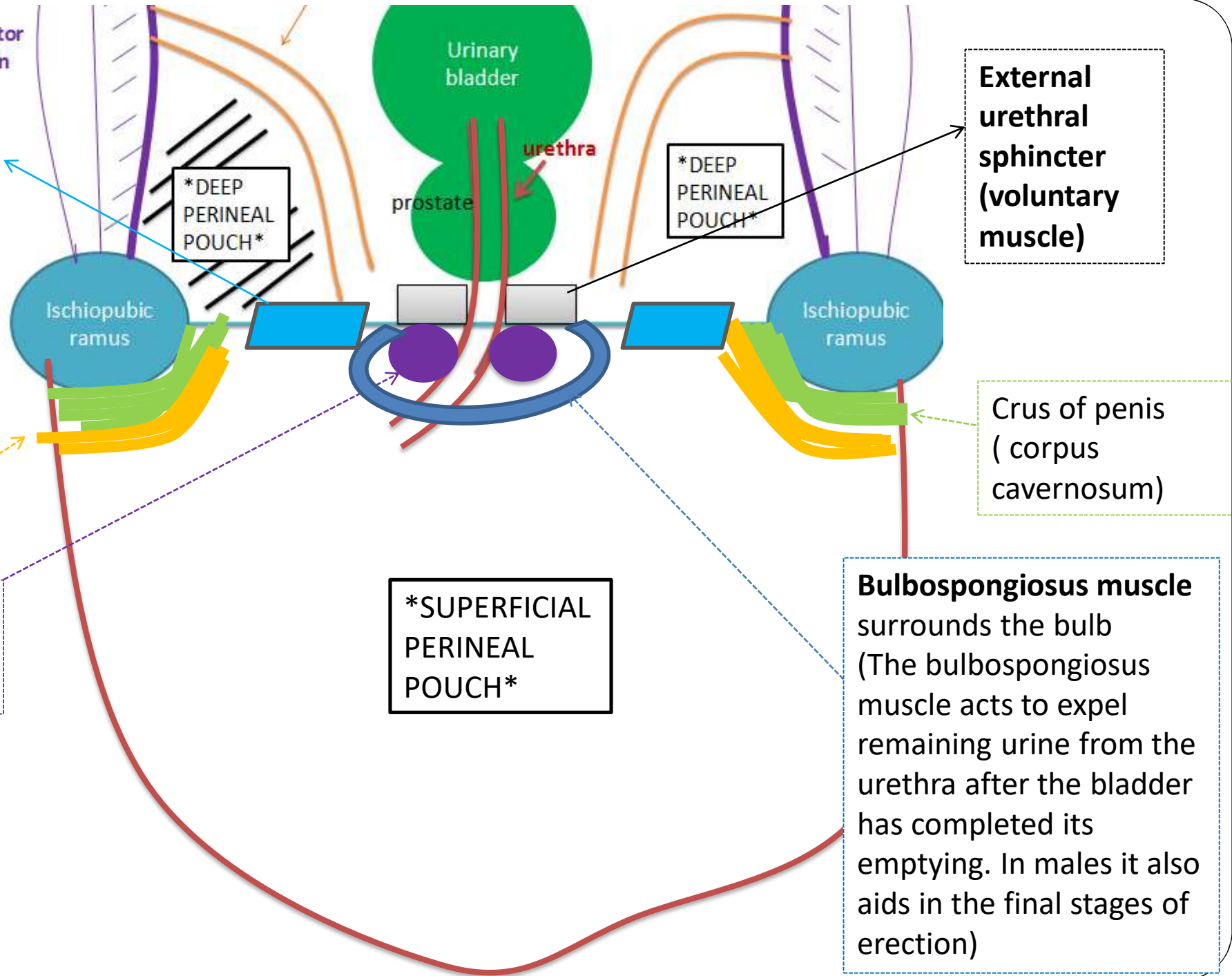
DEEP PERINEAL POUCH

DEEP PERINEAL POUCH

Ischiopubic ramus

Ischiopubic ramus

SUPERFICIAL PERINEAL POUCH



Muscle	Origin	Insertion	Nerve Supply	Action
Male Urogenital Muscles				
Bulbospongiosus	Perineal body	Fascia of bulb of penis and corpus spongiosum and cavernosum	Perineal branch of pudendal nerve	Compresses urethra and assists in erection of penis
Ischiocavernosus	Ischial tuberosity	Fascia covering corpus cavernosum	Perineal branch of pudendal nerve	Assists in erection of penis
Sphincter urethrae	Pubic arch	Surrounds urethra	Perineal branch of pudendal nerve	Voluntary sphincter of urethra
Superficial transverse perineal muscle	Ischial tuberosity	Perineal body	Perineal branch of pudendal nerve	Fixes perineal body
Deep transverse perineal muscle	Ischial ramus	Perineal body	Perineal branch of pudendal nerve	Fixes perineal body
Female Urogenital Muscles				
Bulbospongiosus	Perineal body	Fascia of corpus cavernosum	Perineal branch of pudendal nerve	Sphincter of vagina and assists in erection of clitoris
Ischiocavernosus	Ischial tuberosity	Fascia covering corpus cavernosum	Perineal branch of pudendal nerve	Causes erection of clitoris
Sphincter urethrae	Same as in male			
Superficial transverse perineal muscle	Same as in male			
Deep transverse perineal muscle	Same as in male			

Origin and Insertion READ ONLY

Perineum contains two **fibromuscular masses** which are :

A- Anococcygeal raphe (and body) :

- It is a fibromuscular mass which extends from the tip of coccyx to the recto anal junction.
- It is easily stretched during defaecation and labour and recoiled by the coccygeus muscles.
- It supports the lower part of the rectum.

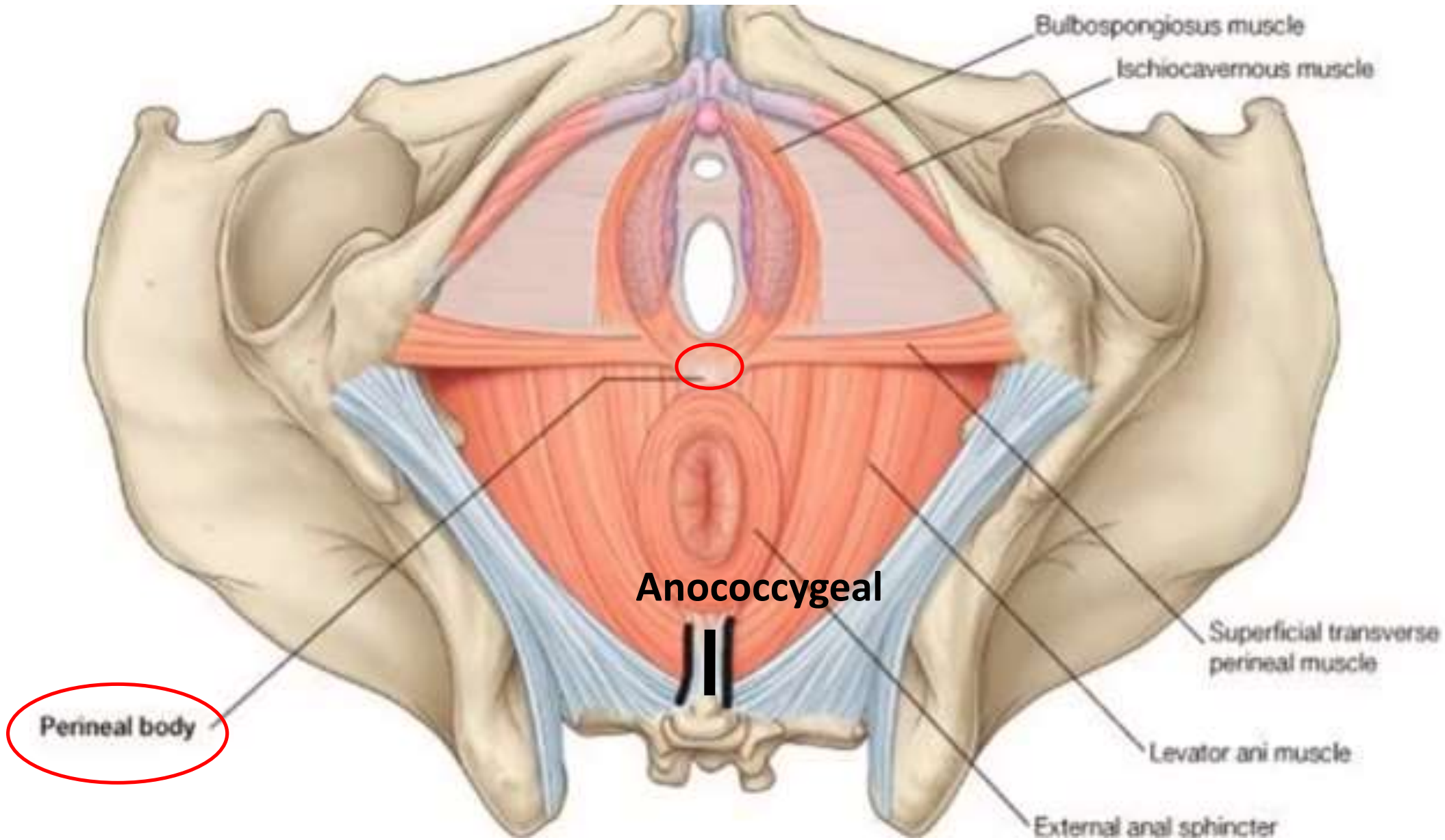
See next slide for
more clarification

B- Perineal body (central tendon of the perineum) : (remnant of urorectal septum)

- It is a fibromuscular mass situated in the median plane, in front of anus.

Relations :

- **In the male :** it lies between anal canal (posterior) and bulb of the penis (anterior).
- **In the female :** it lies between anal canal (posterior) and lower part of vagina (anterior).
- Importance : perineal body supports the uterus and vagina.
- **Rupture of it during labour may result in prolapse of uterus**



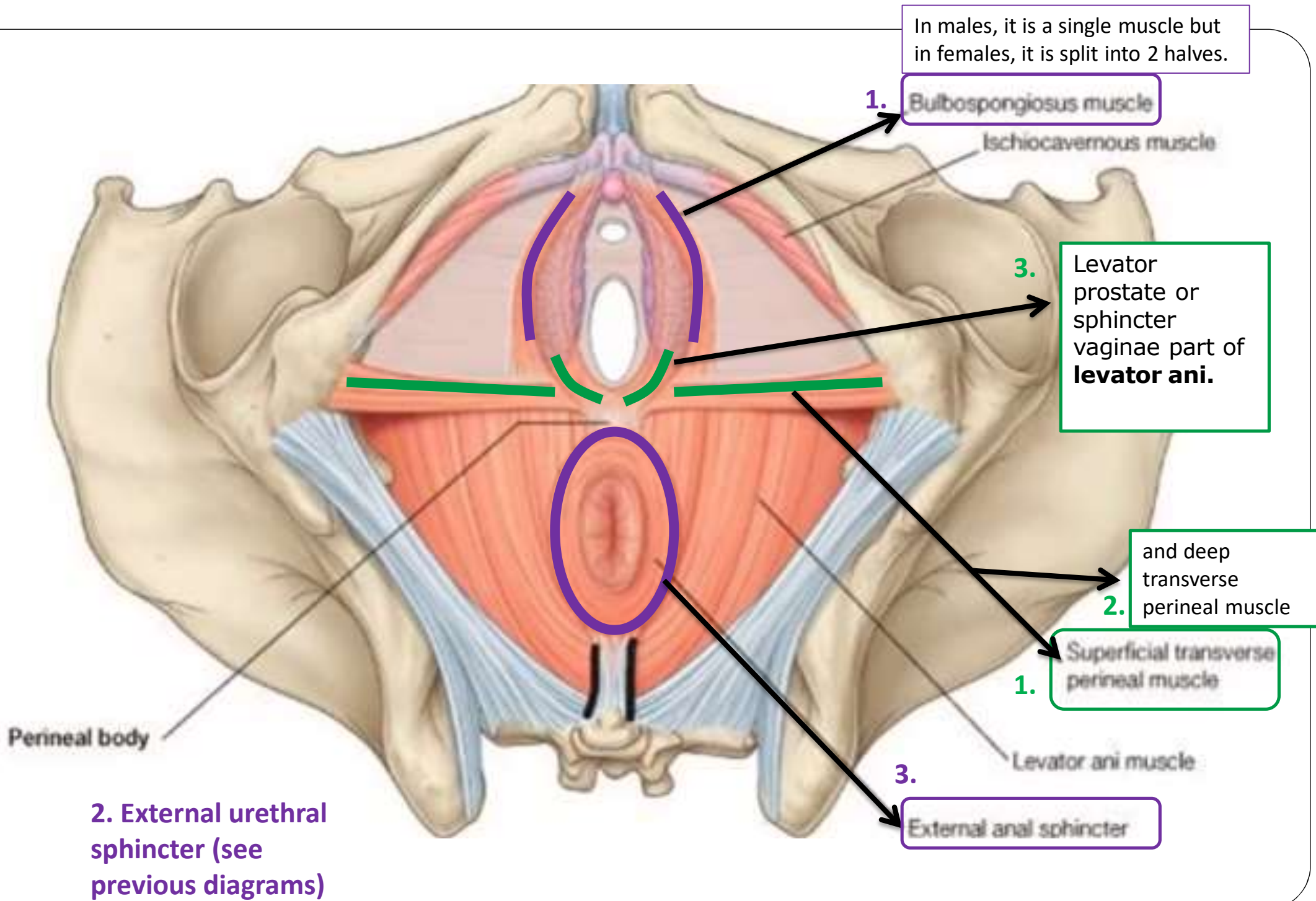
Muscles attached to the perineal body : 3 paired and 3 single muscles :

3 paired muscles

- 1. Superficial transverse perineal.**
- 2. Deep transverse perineal.**
- 3. Levator prostate or sphincter vaginae part of levator ani.**

3 single muscles

- 1. Bulbospongiosus.**
- 2. Superficial part of external urethral sphincter (sphincter urethrae).**
- 3. Superficial part of external anal sphincter**



Perineal body (central tendon of the perineum)

Muscles attached to the perineal body : 3 paired and 3 single muscles :

3 paired muscles

1. Superficial transverse perineal.
2. Deep transverse perineal.
3. Levator prostate or sphincter vaginae part of levator ani.

3 single muscles

1. Bulbospongiosus.
2. Superficial part of external urethral sphincter (sphincter urethrae).
3. Superficial part of external anal sphincter



Perineal body



Ischio-cavernosus



Bulbospongiosus



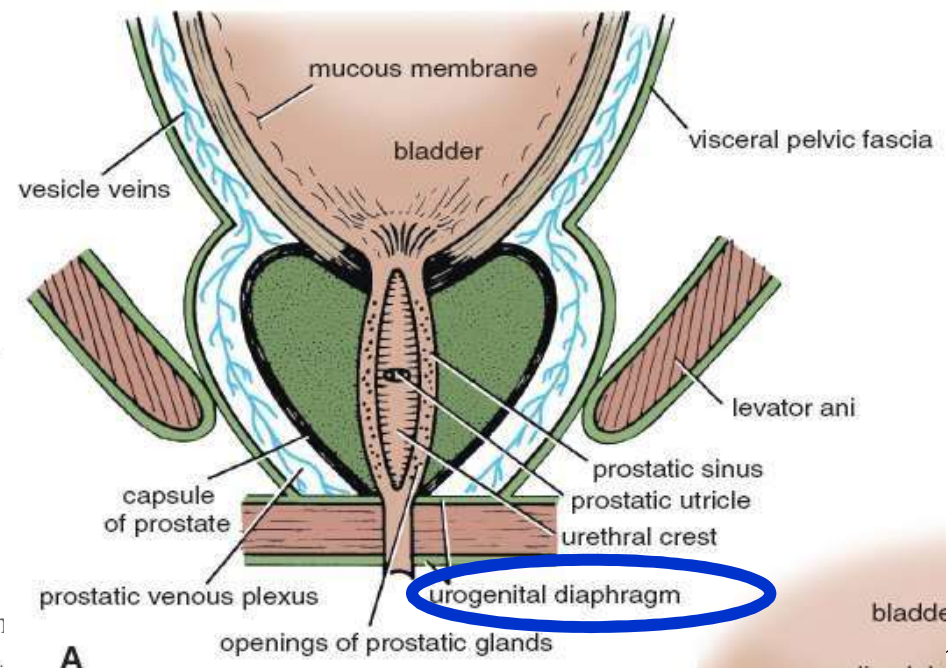
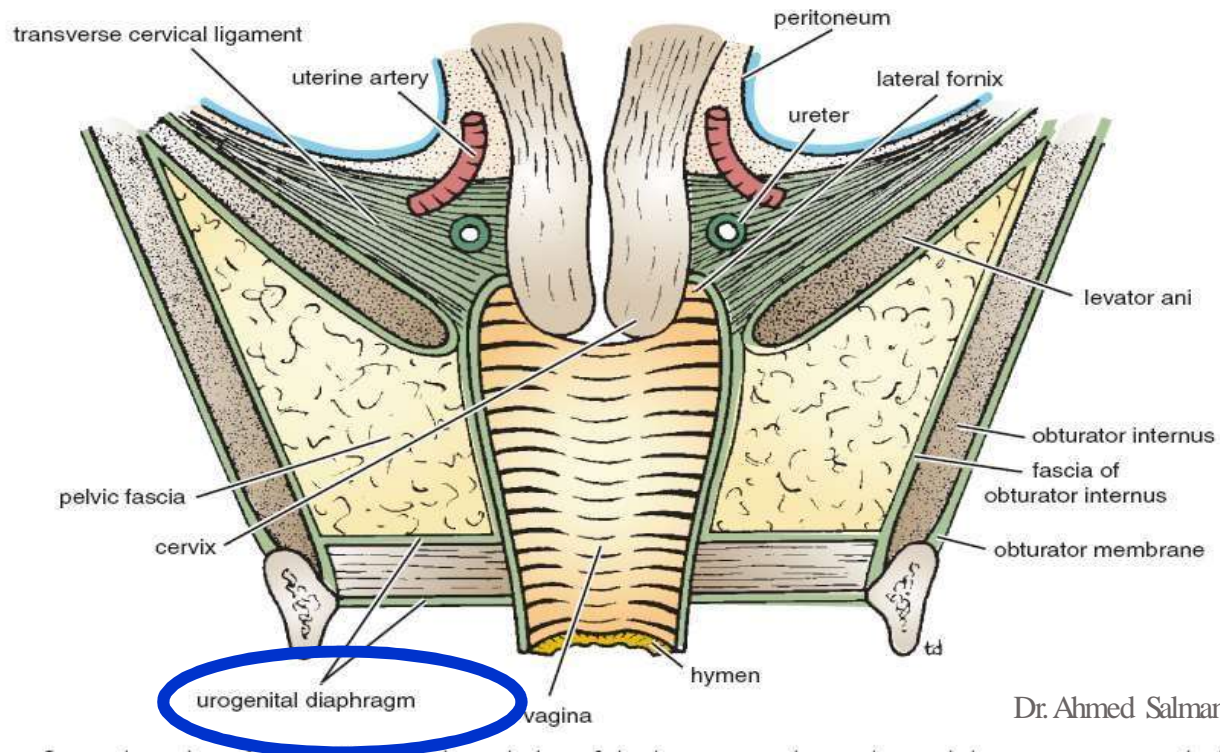
Transverse perineal

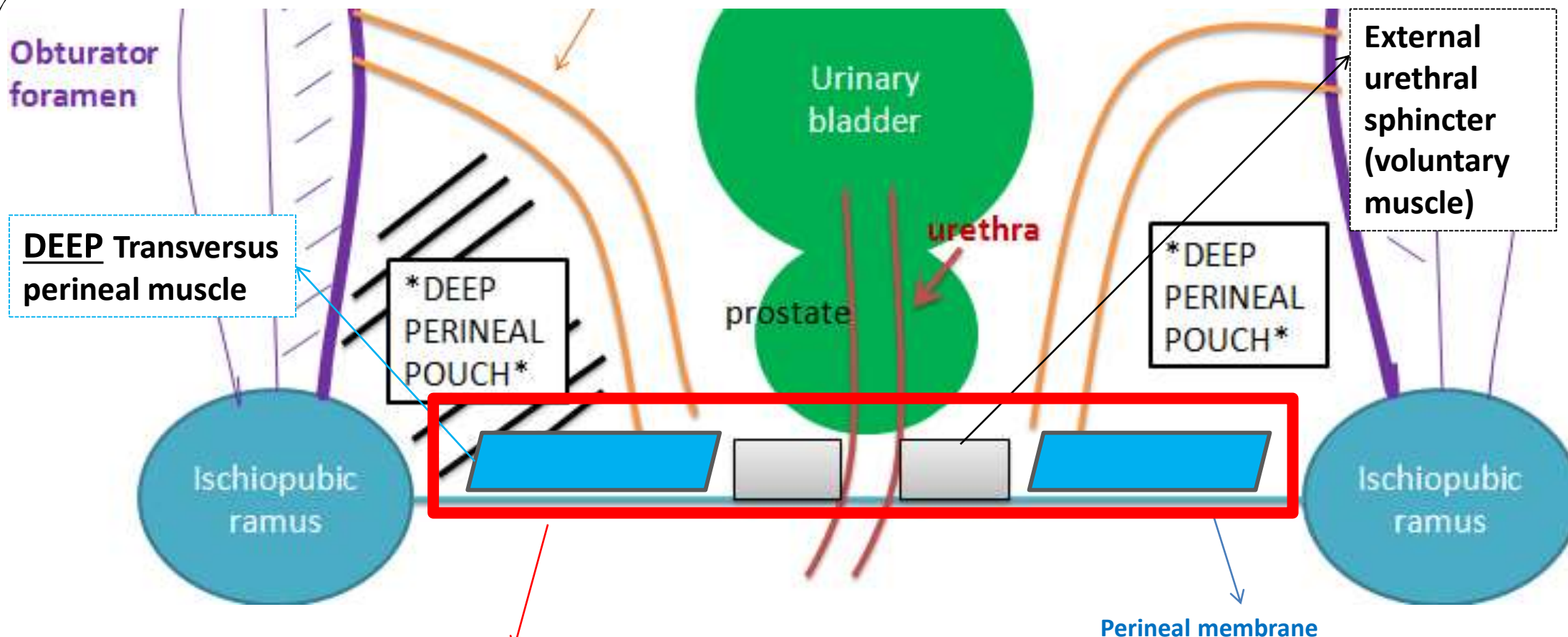
NOT attached
to the
perineal body

Just another
diagram

Urogenital Diaphragm (see next slide FOR MORE CLARIFICATION)

- It is a triangular musculofascial diaphragm situated in the anterior part of the perineum
- It fills the gap of the pubic arch
- It is formed by the **sphincter urethrae** and the **deep transverse perineal** muscles
- These two muscles are enclosed between a superior and an inferior layer of fascia of the urogenital diaphragm.
- The inferior layer of fascia is the perineal membrane.





Urogenital diaphragm = a diaphragm that contains **TWO MUSCLES** (deep transversus perineal AND external urethral sphincter) and is surrounded by **TWO LAYERS OF FASCIA** (superior and inferior). The diaphragm is considered a part of the deep perineal pouch.

Superior layer of fascia

Deep transversus And external urethra

Inferior layer of fascia which is the **PERINEAL MEMBRANE**

The perineal fascia

See slide 29 for more clarification

- consists of **superficial** and **deep** layers
- **Superficial perineal fascia**, consists of a **superficial fatty layer** and a **deep membranous layer** (*Colles fascia*).

1-The superficial fatty layer

In females, It makes up the substance of the labia majora and mons pubis

It is continuous with the fatty layer of subcutaneous tissue of the abdomen

(Camper fascia)

In males, the fatty layer is replaced with smooth **Dartos muscle**.

It is continuous with the fatty layer of subcutaneous tissue of the abdomen .

In both sexes, it is continuous posteriorly with the ischio-anal fat pad in the anal region .

2-The membranous layer (*Colles fascia*)

See slide 29 for more clarification

is attached To

Posteriorly : The posterior margin of the perineal membrane and the perineal body

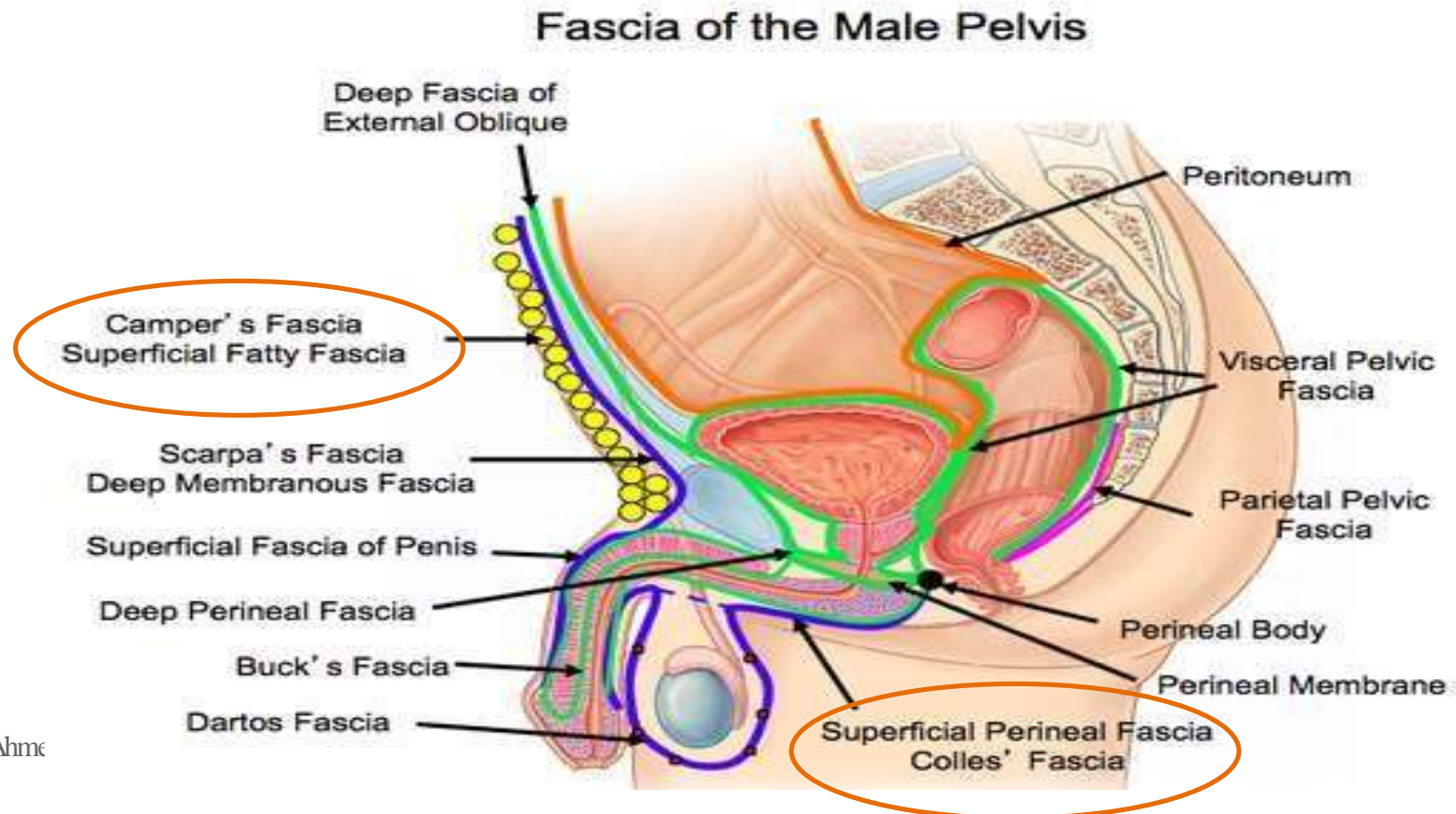
Laterally, the *fascia lata* (deep fascia) of the upper medial aspect of the thigh.

Anteriorly, in the male, the membranous layer of subcutaneous tissue is continuous with the fascia of the penis and scrotum

On each side of and anterior to the scrotum, the membranous layer becomes continuous with the membranous layer of subcutaneous tissue of the abdomen (*Scarpa fascia*) .

The perineal fascia (deep perineal, investing, or Gallaudet fascia)

- Invests the ischiocavernosus, bulbospongiosus, and superficial transverse perineal muscles.
- It is also attached laterally to the ischio-pubic rami.
- Anteriorly, it is fused to the suspensory ligament of the penis



The perineal fascia

Superficial perineal fascia

Deep perineal (Gallaudet fascia)

The superficial fatty layer

It is continuous with **(Camper fascia)**

Abdominal fatty layer

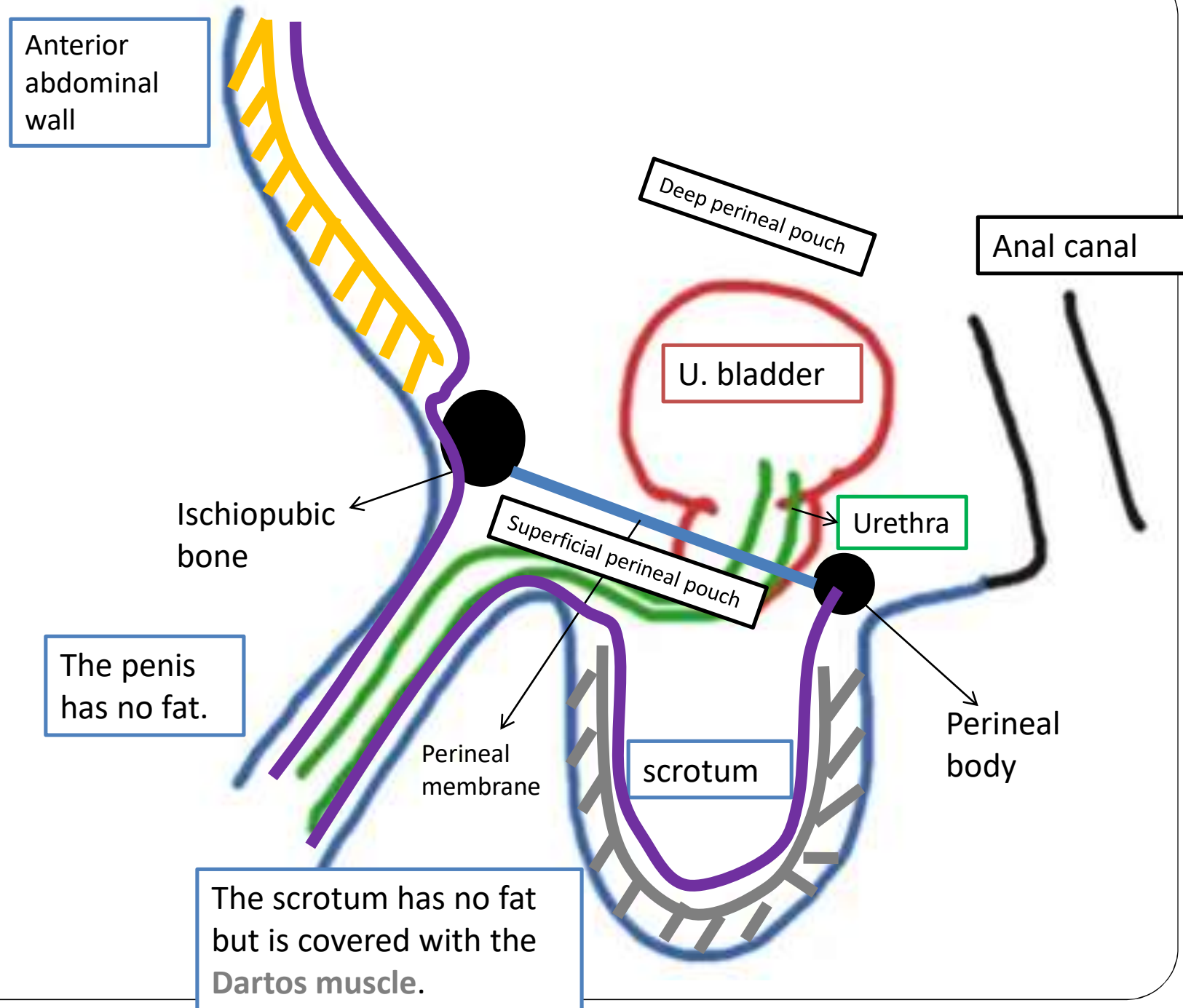
The membranous layer (*Colles fascia*)

It is attached to ***fascia lata***

It is continuous with **(*Scarpa fascia*)**

The Superficial Perineal Fascia = **superficial fatty layer** AND **deep membranous layer (COLLES FASCIA)**.

- (1) the superficial fatty layer is found ONLY in the ant. abd. wall
- (2) The deep membranous covers the ant.abd.wall and the penis and the scrotum, then it is attached to the perineal body.
- (3) Remember! Between the perineal mem. and Colles fascia is the superficial perineal pouch



Rupture of the Urethra

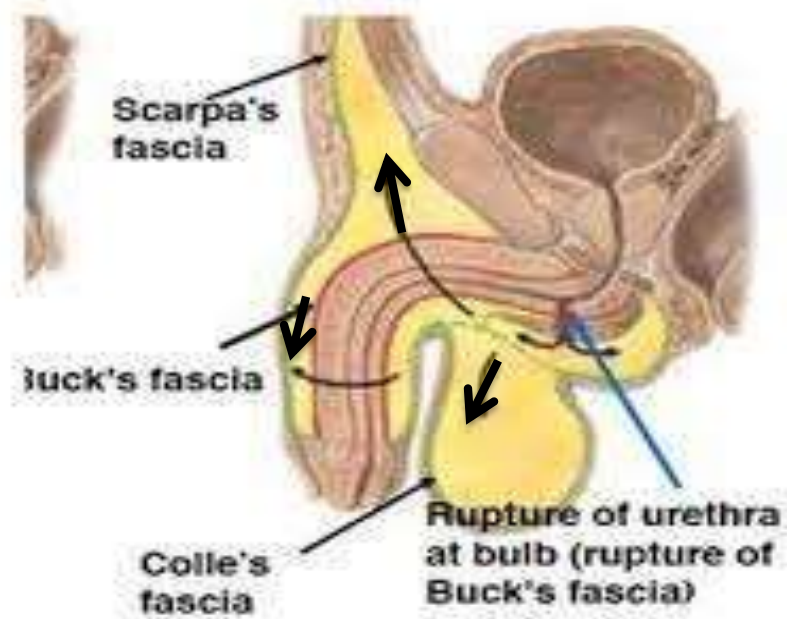
1- Spongy Urethra

Cause : (Straddle injury)

- a) Sever blow to perineum
- b) Falling on metal beam

The urine extravasates into the superficial perineal pouch and then passes forward into loose connective tissue of the scrotum ,around the penis beneath the membranous layer of the subcutaneous connective tissue of lower part of anterior abdominal wall.

See slide 33 for more clarification

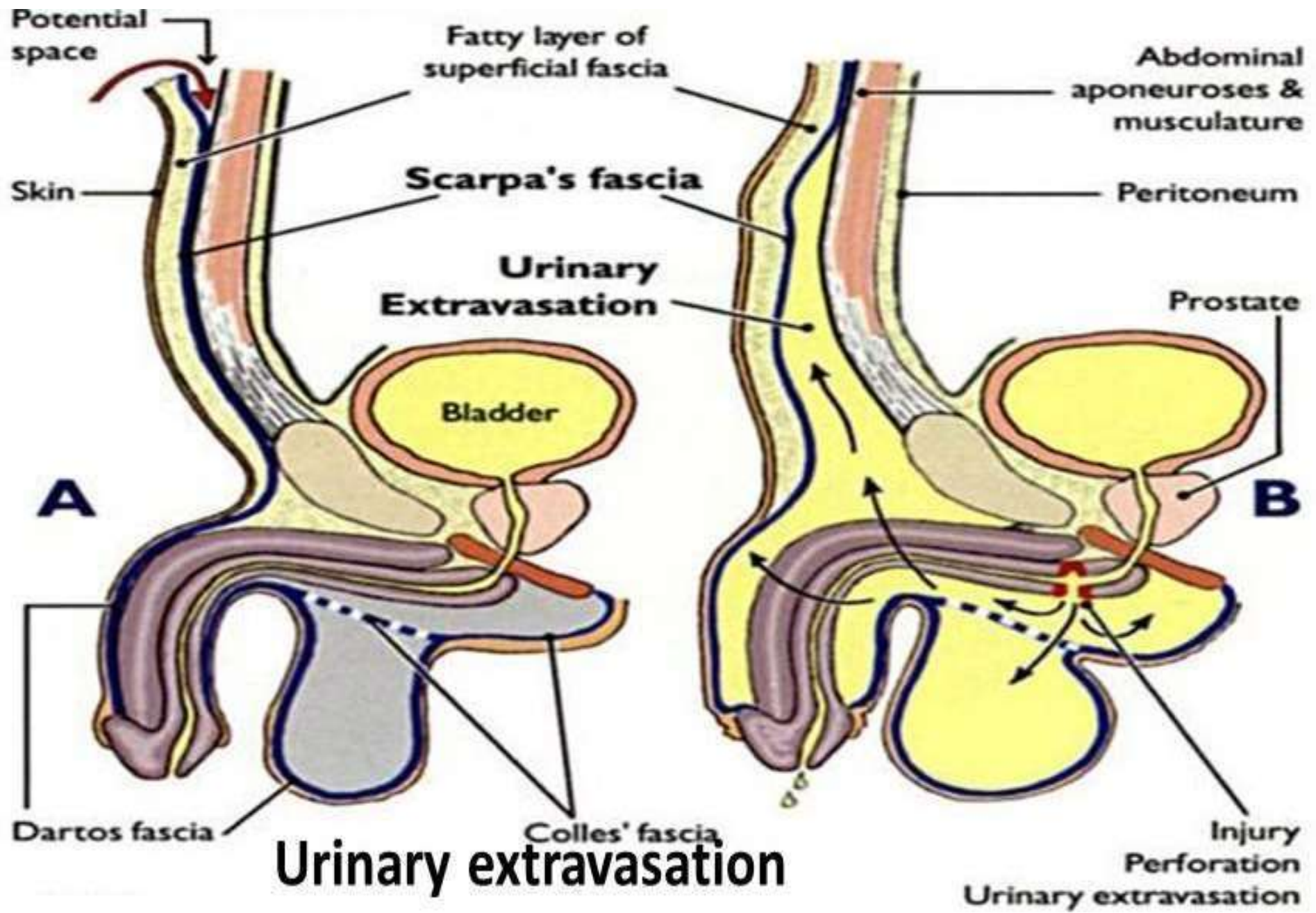


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Straddle Injuries



Lower GU Trauma



Site of rupture

2-Membranous part

Cause:

- a) Fracture Pelvis
- b) Fault catheterisation

The urine escapes into the deep perineal pouch and may be pass upward around the prostate and bladder (extra peritoneal) through urogenital hiatus.

See slide 33 for more clarification



IN BOTH CASES (VERY IMPORTANT)

The urine cannot pass into thigh because of attachment of Colles fascia with fascia lata below the inguinal ligament.

Also cannot pass posteriorly to the anal triangle due to fusion of the superficial and deep layers of perineal fascia around the posterior edge of the perineal membrane.

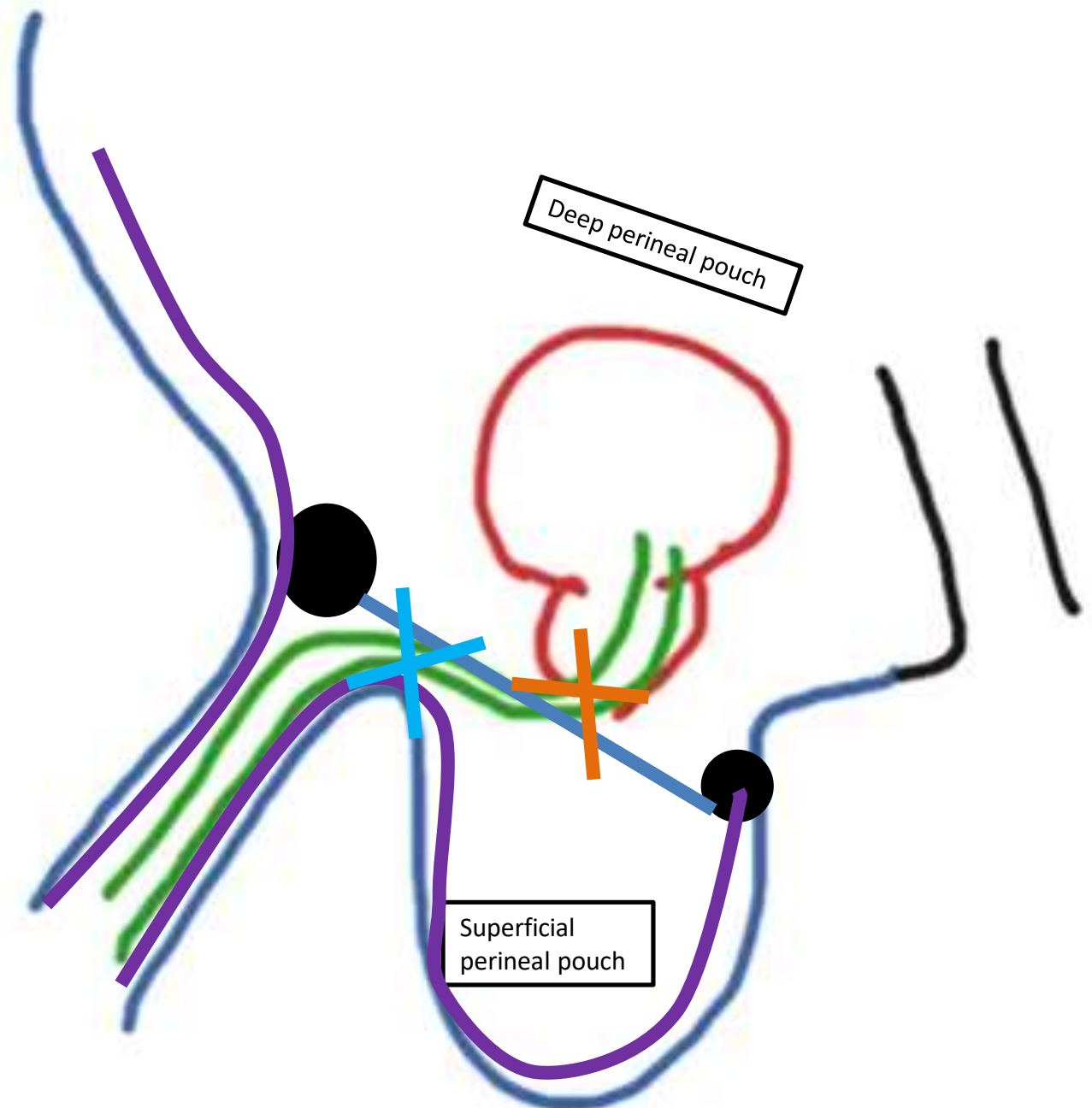
What would happen if there is a rupture in the urethra ??

Rupture 1 X Spongy/Penile urethra

The urine will go to the scrotum, penis and ant.abd.wall (superficial perineal pouch) **BUT it won't go to the THIGH. Why ? Due to fascia lata**

Rupture 2 X Membranous Urethra

The urine will go to the deep perineal pouch. Remember! The deep perineal pouch is **CLOSED SPACE** so, the urine won't go elsewhere (however it may pass into a small space which is the urogenital hiatus ;))



**A Man during walking on street fall on cesspit.
What is the possible injures?
Is he able to micturate voluntary ?**



END OF LECTURE 10